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ABSTRACT

The main purpose of this study was to investigate the relationship between teacher behaviors and pupil behaviors, achievement, and attitudes. The study was conducted in six elementary school classrooms. Eight high-inference scales were also used to obtain measures of classroom management, instructional skills, and interpersonal skills. It was found that private interactions (1) occurred more often than public interaction, (2) favored low achievers in terms of frequency, (3) were positively related to pupil unproductive behavioral styles, and (4) were negatively related to pupil attitudes. Direct teaching patterns were functional for pupil achievement but not for pupil attitudes. (Author/JD)

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TEACHER PROCESS VARIABLES AND PUPIL PRODUCTS

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ABSTRACT

"Teacher Process Variables and Pupil Products"

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Relationships between teacher behaviors as measured by the expanded Brophy-Good dyadic interaction system, and pupil behaviors, achievement and attitudes were examined in six elementary school classrooms. Eight high inference scales were also used to obtain measures of classroom management, instructional skills and interpersonal skills.

Private interactions occurred more often than public interaction, favored low achievers in terms of frequency, were positively related to pupil unproductive behavioral styles (CASES) and were negatively related to pupil attitudes.

Direct teaching patterns were functional for pupil achievement but not for pupil attitudes.

TEACHER PROCESS VARIABLES AND PUPIL PRODUCTS

Introduction

In the past two decades, teaching effectiveness studies have been relatively few and have yielded conflicting and inconsistent results (Rosenshine, 1971, 1976; Heath and Nielson, 1974). Many of these studies, using systematic observation of teaching, have been done outside of real classrooms with subjects other than real working teachers and learners. There exists therefore a "shortage of data on teacher behavior in naturalistic teaching situations: (Brophy and Evertson, 1976, p.7). It is because of this lack of data generated by studies done in real classrooms that Brophy has justifiably said, "research on teaching literally is in its infancy" (Brophy, 1976a, p.34), and "...is truly primitive" (Brophy, 1976b, p.21).

At the same time concerned educational leaders attempt to improve the quality of education by funding a variety of innovative teacher education programs. But because of our lack of knowledge of the relationship between treacher behavior and student outcomes, these "improvements" must of necessity be justified "with unsubstantiated 'logic' or 'theory'" (Rosenshine and Furst, 1971, p.64). Recently J. Brophy (1976b) in commenting on teacher training protocol materials said:

> the knowledge base about how to accomplish teacher training goals...is ahead of the knowledge base supporting the efficacy or desirability of the skills included in the content of these training efforts...Thus, I would urge everyone connected with educational research to help develop this knowledge base further. (p.7)

There exists, therefore, a need for process-product data generated from a study of teachers and learners in real classrooms.

The Problem

The main purpose of this study was to investigate the relationship between teacher behaviors and pupil behaviors, achievement and attitudes.

An examination was made of classroom processes such as:

1. Teacher-pupil dyadic interaction using a low inference multiple coding category system (Brophy and Evertson, 1973), and
2. Teacher classroom management skills, (Withitness, Overlappingness, Smoothness and Momentum), instructional skills (clarity and persuasiveness), and interpersonal skills (warmth and empathy), using high inference rating scales.

The classroom processes observed and measured were analysed in relationship to:

a) pupil behaviors, as measured by Spaulding's Coping Analysis Schedule for Educational Settings (CASES);

b) pupil behaviors, as measured by absenteeism and disciplinary action taken by the school administration;

c) pupil achievement - as measured by the Metropolitan Achievement Test-Reading and Mathematics; and

d) pupil attitudes - as measured by the Children's Attitude scale, the My Class Inventory, the School Attitude test and the Cooper-smith Self-Esteem Inventory.

This study is part of an extensive group research project which

used the Dunkin and Biddle model as a guide for the study of classroom teaching (Figure 1).

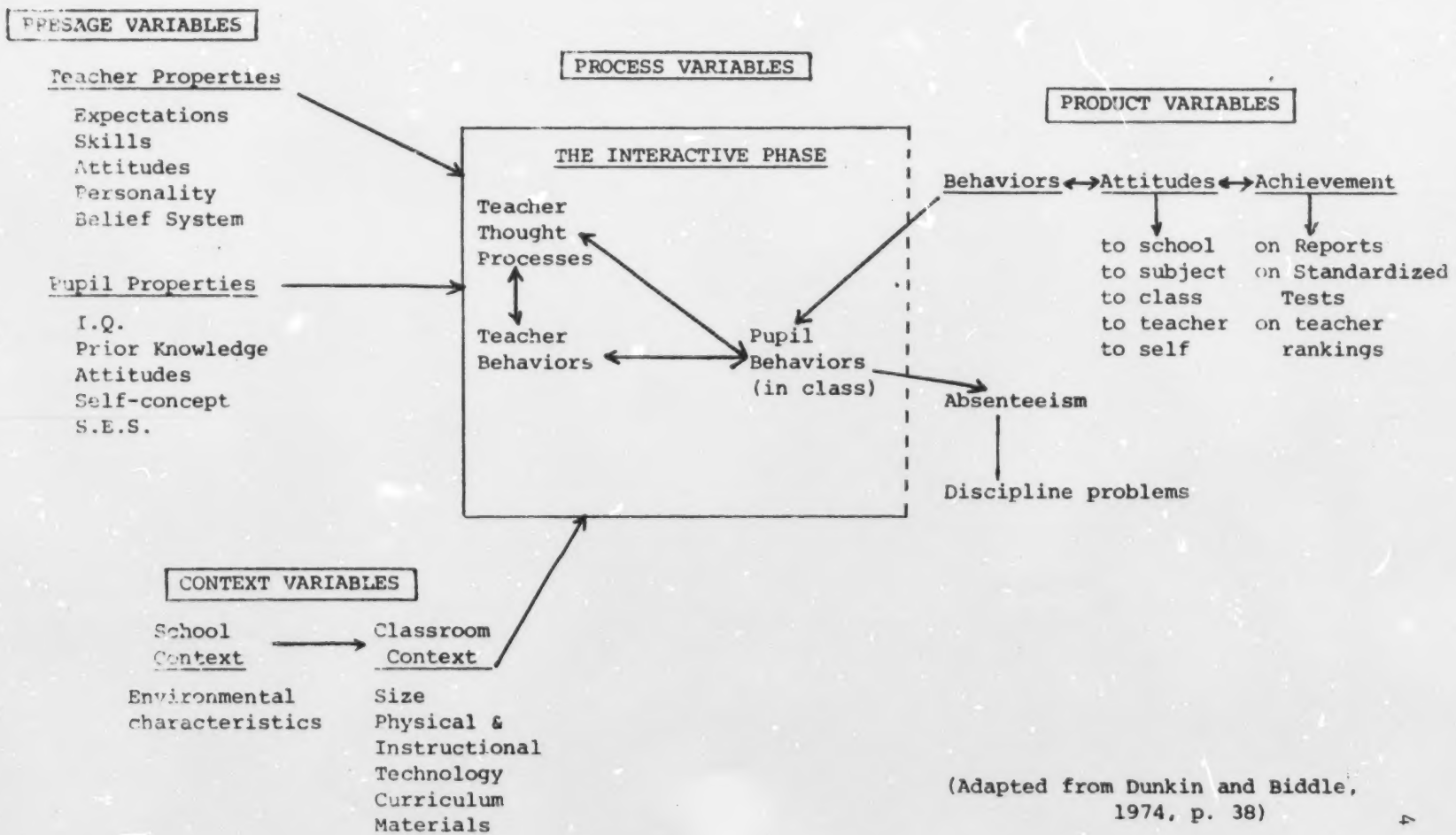
Background to the Problem

The most widely referred to reviews of studies of teacher effects done during "the modern era" (Rosenshine, 1976), are those of Rosenshine (1971), Rosenshine and Furst (1971) and Dunkin and Biddle (1974). The findings reported by the Rosenshine reviews are generally conceded to be inconclusive.

The more comprehensive review of studies using classroom observation done by Dunkin and Biddle (1974) at first appear to provide a massive accumulation of process-product evidence. But not so. Dunkin and Biddle (1974) summarize their review of the 178 studies in chapter eleven--"Findings for Teachers" (p. 357). The process-product evidence is indeed inconclusive and inconsistent. Figure 2 summarizes the ten charts of findings for teachers presented by Dunkin and Biddle's chapter eleven, extracting only the process-product studies. It becomes clear that the field of classroom analysis research has been dominated by those in the Flanders' tradition (note the number of studies in the first three categories, Indirectness, Climate and Directness). It is also clear that there are some very serious gaps. (1) Very few investigators have used observational systems emphasizing the cognitive dimensions of teaching and learning. (2) Dunkin and Biddle report no process-product data in the area of classroom management. (3) Only one investigator outside of the Flanders' tradition looked at pupil attitudes as a product measure. (4) Very few observation systems have been used more than once or twice either by one

FIGURE 1

A MODEL FOR THE STUDY OF CLASSROOM TEACHING



(Adapted from Dunkin and Biddle, 1974, p. 38)

FIGURE 2

SUMMARY OF PROCESS-PRODUCT STUDIES FROM DUNKIN AND BIDDLE
FINDINGS FOR VARIABLES—NUMBER OF PROCESS-PRODUCT STUDIES
RELATING VARIABLE TO ACHIEVEMENT AND/OR ATTITUDES

		Pupil Achievement			Pupil Attitudes		
Studies of	Variable	Related	Unrelated	Cur. or Com.*	Related	Unrelated	Cor. or Com.*
Indirectness climate	1. Indirectness	10	20	6	9+	5	
	2. Praise or approval	3	11	1	1+	4	
	3. Acceptance of pupils' ideas	1	6	1	3+	3	
	4. Criticism or disapproval	6(lower)	7	1	2-	3	
Directiveness	5. Teacher talk		7		1+ 2-	4	
	6. Teacher questions	1	6		1+		
	7. Teacher lecturing	1					
	8. Pupil talk		5				
	9. Pupil res. to T. initiations	1					
Beh. Mod.	10. T. use of tokens	2(target)					
	11. T. use of vicarious reinforcement	1(nontarget)					
Classroom as social system	12. T. emission of Res. moves		1				
	13. T. emission of Pos. reactions	2					
	14. T. emission of Str. moves		1	1			
	15. T. use of gesture and movement	1					
	16. "Stimulation" - media			1		1	
Knowledge & intellect	17. T. use of higher order categories		1	1			
	18. Divergent rather than convergent			1			
	19. P. use of higher thought levels		1	1			
	20. T. seeks to lift thought levels		1				
	21. T. extends thought on same level		1				
	22. Analytic and evaluative rather than empirical processes	1					
	23. Higher cognitive demand		1	1			
Linguistic concepts	24. Vagueness	1(lower)					
	25. Optimal amount of information			1			
	26. Verbal fluency	1					
	27. Interest			1			
	28. T. use of explicit logic	1					
Sequence	29. Sol Res Rea	1					
	30. Redirect questions	1					
	31. Length of episodes			1			
	32. Episode-terminal structuring Rea	1					
	33. Post question structuring - Sol Rea	1(lower)					
Strategic units	34. Ventures combining descriptions and instances	1					
	35. Lesson - terminal summary	1					

*Cur. or Com. = Curvilinear or complex relationships.

investigator or by more than one investigator. And finally (5) few investigators have used pupil behaviors as outcome measures (that is, pupil in-class coping behaviors).

Dunkin and Biddle's (1974) conclusions are similar to those of Rosenshine and Furst's. They too conclude that the findings are "tentative" and unconfirmed. They refer to the "Findings for Teachers" in Chapter XI (1974) as "suggestive" (p. 148). But it is clear that these findings are suggestive for further research, not for preferred teaching styles or behaviors (Flanders, 1976).

The reviews of Rosenshine and Furst, and Dunkin and Biddle have not only stimulated much discussion about what is known about teaching but have influenced much of what is presently being done in the area of teacher effectiveness. There are those who have examined the reviews and have moved from the correlational type study to a more tightly controlled experimental design (Gage, 1976; Gall et al., 1976). Others, namely, Brophy-Evertson, 1976; Soar, 1973; Stallings, 1976; Good-Grouws, 1975; and McDonald, 1976; have responded to the Rosenshine and Furst and Dunkin and Biddle reviews with less optimism than the Stanford experimenters. This is evidenced by their attempts to strengthen or accumulate more process-product data through conducting more correlational studies.

An examination of the Brophy and Evertson Texas studies (Brophy and Evertson, 1976), leads one to conclude that methodology for research in naturalistic settings has improved considerably. The use of both high and low inference observation systems, the multiple-coding category systems used, the length of time actually spent observing in the classroom, the

collection of presage, process and product data, and the separate analysis of the data for high and low SES schools reflects both an awareness and a consideration of the complexity of teaching and learning in naturalistic settings. These Texas studies were the main source of instrumentation on teacher processes for the present investigation.

Procedures

Six teachers volunteered to participate in a large scale study of teaching and learning of which this study is one part. The sample of teachers included one grade one teacher, one grade three teacher, and one grade six teacher, in each of two schools. The sample of students included 159 students, 49 grade ones, 59 grade twos and 51 grade sixes. Teacher process data were collected using the Expanded Brophy-Good Dyadic Interaction Observation System. Eight high inference rating scales were also used to obtain measures of classroom management, instructional, and interpersonal skills. Observations extended over a three week period with 10 hours' observations in grades one and three language arts and mathematics classes and 7 1/2 hours of observation in grade six language arts classes.

Metropolitan Achievement Tests (MAT Reading and Mathematics) were administered to the students in the six classes. Measures of pupil attitudes to school, class, teacher, peers and self were taken as follows:

Grade Ones - The Oral School Attitude Test (SAT),

Grade Threes and Sixes - The Children's Attitude Inventory (CAI),

All Grades - The Coopersmith Self Concept Test (SEI),

All Grades - The My Class Inventory (MCI).

The number of times a student was sent to the office for disciplinary reasons and student absenteeism were recorded as circumstantial evidence of pupil attitudes to school. Finally, pupil behavioral styles calculated from intensive observations of pupils' coping behaviors in both teacher directed and non-teacher directed settings were used as product measures. R. Spaulding's CASES observational system was used to collect behavioral data on each student in each class.

The CASES instrument was designed to identify 13 basic categories of coping behaviors. Spaulding (1973) explains the development and content of CASES as follows:

> Basic to its development were the concepts of "integrative" and "dominative" social behavior as delineated in the work of H. H. Anderson. In addition to generally "active" and "passive" styles of child response to environmental stimuli, CASES includes categories which reflect "overt aggression," "passive aggression," "independence," "autonomy," "dependence," "avoidance," and "withdrawal" (p. 1).

By creating combinations of the category frequencies, it is possible to produce coefficients representing "styles" of coping behaviors as well as an overall CASES coefficient (OCC). The styles are:

Style A - Aggressive, annoying, bothering, dominative, controlling, manipulative.

Style B - Inappropriately self directed or socially active, peer-oriented, talkative, resistant to authority, delaying, non-conforming.

Style C - Passive, withdrawn, fearful, avoidant.

Style D - Peer dependent, peer observant, distractible.

Style E - Compliant, dependable, studious, conforming, adult-dependent.

Style F - Social, assertive, integrative.

Style G - Independent, productive, self-directed, non-social.

Style H - Other-directed, conforming to authority, task-oriented when supervised.

The visibility thresholds for each style were empirically developed so that a coefficient of 1.00, considered to reflect a dominant or visible behavior pattern, represents a point one standard deviation above the mean obtained for each style in a smple of approximately 2,700 pupils in grades 1 through 12.

There were four distinct phases in the research project, namely:

1. training,
2. in school familiarization,
3. data collection (observational), and
4. data collection (testing). (See Figure 3)

Data Analyses

Teacher process data derived from the low inference observational system were categorized. Then frequencies and proportions of behavior types and sequences were calculated. The process variables for use in correlational analysis were determined on the basis of what teachers did most often. Note: each teacher's main interaction sequences are marked (†) on tables 1, 3, 5, 7, 9 and 11.

Results

TAbles 1, 3, 5, 7, 9 and 11, provide correlational data between teacher Brophy and Evertson (B and E) process variables and student achievement attitudes and discipline and absentee frequencies. Tables 2,4,6,8,10

FIGURE 3

SUMMARY OF THE FOUR PHASES OF THE STUDY

Month	Phase	Monday	Tuesday	Wednesday	Thursday	Friday
APRIL	1 TRAINING	5 Training on campus with manuals, lesson transcripts, and videotape				
		12 Live coding in schools used for training				
		19 Live coding in schools used for training				
		26 Live coding in schools used for training				
MAY	2 FAMILIARIZATION	3 Sch. 1	Sch. 2	Sch. 1	Sch. 2	Sch. 1 ---- Sch. 2
	3 DATA COLLECTION (OBSERVATIONS)	10 Live coding				
		17 Live coding				
		24 Live coding				
	4 DATA COLLECTION (TESTING)	31 Testing				
JUNE		7				
		14 Re-testing				
		21 Class and staff parties in each participating school				

and 12 provide correlational data between teacher B and E process variables and pupil behavioral styles. Table 13 provides correlational data between the high inference ratings on teacher process variables and pupil achievement, attitudes and behaviors.

Table 14 provides a summary of the first 13 tables and will be referred to in the following discussion.

1. Proportions of private interactions were high. They ranged from .23 to .85 in language arts and from .51 to .94 in mathematics. It is reasonable to assume therefore that little time was spent in direct teaching compared to private individualized instruction during seatwork. Table 14 (variables 1-15) reveals that private interaction variables were generally not positively related to achievement, and were negatively related to pupil attitudes.

Trends in the data suggest that private interactions may be a function of student ability, self concept and behaviors. For example: (1) frequency or private interactions generally favored low achievers; (2) students with positive academic self-concept who engaged in productive behaviors in teacher directed settings, initiated interactions with the teacher and received attention and help from the teacher; and (3) teacher initiated private interactions correlate positively more frequently with unproductive student behaviors than they do with productive student behaviors. It is reasonable to suggest that the effects of the reactive nature of teacher behaviors were negative attitudes to school, to instruction and teacher, and to others.

2. Proportions of public interactions were low. They ranged from .15 to .67 in language arts and from .06 to .49 in mathematics. Only two teachers had higher proportions of public interactions than private interactions.

Table 14 (see variables 16 to 27) reveals that public interactions consisting of questions that students answered correctly followed by the teacher simply affirming the correct answers, were positively related to pupil achievement and productive behaviors in teacher directed settings and negatively related to pupil attitudes.

Self reference and process questions were positively related to achievement in three classes. Product questions were positively related to achievement in two classes and in one class all three question types were positively related to achievement. Question type and the way the teacher selected a respondent did not appear to be as important as asking questions that students could answer correctly.

3. Praise and criticism occurred infrequently within academic interactions. As expected criticism correlates negatively with achievement, attitudes and productive behaviors. Praise also correlates negatively with achievement and academic self-concept, suggesting that praise is a reactive response of the teacher to students of low ability and low self-concept.

4. Teachers who were skilled in classroom management and interpersonal warmth generally had students with positive attitudes to the class. More specifically the students did not perceive their class as overly competitive. Management skills also resulted in little withdrawn behaviors by students. Persuasiveness or the teacher's ability to motivate, appeared

to be functional in reducing withdrawn and peer dependent behaviors and encouraging productive behaviors in both teacher directed and non-teacher directed settings.

Conclusions

1. Interaction sequences were relatively consistent across subject matter and lesson type. The practice of choosing an interaction sequence or a style of teaching or more broadly a model of teaching, appropriate for specific lesson objectives, subject matter of students, was not evident.

2. The data showing the differential frequency of interaction of various groupings of students suggest that classroom interaction and student effects are cyclical in nature. Student achievement, attitudes and behaviors are as much a function of classroom interaction as are interactions a function of student effects.

3. The data suggest that drill or recitation lessons are functional for some types of lessons in language arts and mathematics, particularly at the lower grade levels. This type of direct teaching when used to the exclusion of other teaching styles results in negative attitudes to school. Direct teaching may be very appropriate for simple acquisition of facts and it may be allowed that some memorization and drill is boring. But the data in this study suggest that interaction sequences in the direct teaching (drill and recitation) mode were used almost exclusively and therefore were often used inappropriately. It was the extensive use of direct teaching across subjects, and lesson types, with both high and low achievers that seems to account for negative attitudes by the students.

4. Proportionately little opportunity was given for student public expression of opinion. This appeared to be incongruent with at least some language arts lesson objectives, for example, having students predict outcomes, make judgments and inferences, and draw conclusions.

5. Scales developed for the measurement of withitness, overlappingness, smoothness, and momentum (Kounin, 1970) have demonstrated high reliability when used in a variety of classroom contexts. The classroom management skills appear to be important for ensuring positive attitudes and productive pupil behaviors.

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TABLE 1

TEACHER 1 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

	Process Variables	MAT Total Reading	MAT Total Math	SAT Total Score	SEI Sch-Ach Subscale	Discipline Visits to Office	Absen-teeism
1.	Private Interactions	.190	.126	-.388**	.349*	.640***	-.148
2.	Teacher Initiated	.117	.090	-.388**	.225	.434**	-.271
†3.	Work (Brief + Obs)	.197	.250	-.019	.353*	.239	-.149
†4.	Work, Long	-.226	-.284	-.159	-.161	.014	-.143
5.	Procedure	.210	.202	-.180	.140	-.004	-.232
†6.	Behavior. Warn	.191	.041	-.422**	.171	.611***	-.103
7.	Work/Total	-.287	-.096	.444**	-.189	-.354*	.120
8.	Proc/Total	.162	.078	.032	.011	-.208	.018
9.	Beh/Total	.123	.046	-.458**	.085	.638***	-.062
10.	Student Initiated	.216	.160	-.299	.389**	.691***	.004
†11.	Work, Brief	.051	.122	-.263	.344*	.789***	.034
12.	Work, Long	.274	-.090	-.244	.253	.164	.083
13.	Work/Total	-.202	-.306	.193	.235	-.032	.303
14.	Work Long/T & S Work	-.108	-.328*	-.222	-.282	-.283	.030
15.	Work Brief/T & S Work	-.055	-.310	.184	.197	.198	.001
16.	Public Interactions	.543***	.115	-.343*	.384**	.442**	-.108
17.	Teacher Initiated	.438**	.016	-.275	.546***	.103	-.249
18.	Self Ref Ques	--	--	--	--	--	--
19.	Process To (Pre + N Vol) + Ans	--	--	--	--	--	--
20.	Process To (Vol + Call) + Ans	--	--	--	--	--	--
†21.	(Product + Choice) To (Pre + N Vol) + Ans	.539***	-.201	-.343*	.128	.189	-.354*
22.	(Product + Choice) To (Vol + Call) + Ans	.236	-.167	-.051	.083	.152	.162
	Teacher Feedback						
†23.	Correct (+) Ans, Affirmed	.514***	.027	-.175	.197	.140	-.143
24.	+ Ans, No Response	.241	-.040	-.232	.269	.450**	-.033
25.	Failure to Ans +, Terminated	-.178	-.040	-.120	-.194	-.199	-.180
26.	Failure to Ans +, Sustained	.204	-.058	.187	-.146	.198	.087
27.	Student Initiated	.468**	.170	-.297	.436**	.552***	.016
28.	Totals Private and Public	.300	.141	.377*	.047	-.174	.188
29.	Acad with Praise /Total Work Contacts	-.417**	-.238	-.109	-.206	-.168	-.050
30.	Acad with Criticism / Total Work Contacts	-.167	-.146	-.214	.114	.128	.415**

†Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 2:

TEACHER 1 - CORRELATIONS BETWEEN S AND X TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASZS DATA

Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1. Private Interactions	.333*	.145	.165	.026	.019	-.104	-.055	-.087	.106	.217	-.237	-.245	.129	.234	.015	-.023
2. Teacher Initiated	.366*	.238	-.001	.017	-.130	-.050	-.070	.059	.154	.294	-.252	-.199	.224	.222	-.110	.126
3. Work (Brief + Obs)	.086	-.099	.148	-.161	.130	-.186	-.281	-.054	.324*	.297	-.244	-.045	-.006	.454**	-.075	-.196
4. Work, Long	.218	.476**	.045	-.055	-.373*	.263	.214	.236	-.014	.140	-.053	-.144	.213	-.083	-.181	.509***
5. Procedure	.355*	.293	-.530***	.273	-.031	-.029	-.125	-.069	-.155	-.059	-.100	.016	.314	-.192	-.082	.208
6. Behavior, Warn	-.252	.021	.218	-.313	-.103	.258	.091	.152	.150	.229	-.261	-.256	.103	.277	.062	-.149
7. Work/Total	.132	-.152	.238	.035	.036	-.126	-.052	-.024	.079	-.073	.166	.095	-.144	-.019	-.078	.174
8. Proc/Total	.061	.078	-.506***	.326*	.144	-.107	-.141	-.189	-.318	-.318	-.061	.104	.143	-.350*	.088	.049
9. Beh/Total	.132	-.152	.238	.035	.036	-.126	-.052	-.024	.196	.390	-.157	-.198	.064	.357*	.002	.176
10. Student Initiated	.224	.023	.286	.028	.155	-.132	-.028	-.207	.035	.094	-.169	-.232	.008	.192	.131	-.160
11. Work, Brief	.150	-.085	.329*	.017	.094	-.110	-.017	-.111	.028	.081	-.156	-.236	-.149	.223	.160	-.135
12. Work, Long	.441**	.299	-.052	.216	.019	-.072	-.292	-.134	.039	.136	-.013	.074	.225	-.191	-.109	.013
13. Work/Total	.186	.148	-.138	.170	-.132	-.039	-.128	.080	.015	.051	.291	.227	-.091	-.398**	-.118	.110
14. Work, Long/T & S Work	.096	.439**	-.141	.070	-.286	.228	.119	.160	-.129	.006	.080	.009	.216	-.233*	-.169	.492***
15. Work, Brief/T & S Work	-.147	-.437**	.089	-.030	.245	-.206	-.223	-.109	.186	-.020	-.089	.082	-.279	.318	.137	-.449**
16. Public Interactions	.020	-.317	-.093	-.096	.343*	-.242	-.094	-.252	-.236	-.126	-.366*	-.190	.044	.179	.261	-.302
17. Teacher Initiated	-.158	-.301	.168	-.168	.145	.017	.093	-.055	-.386**	-.316	-.192	.032	.146	.600	.212	-.316
18. Self Ref Ques	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19. Process To (Pre + N Vol) + Ans	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20. Process To (Vol + Call) + Ans	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21. (Product + Choice) To (Pre + N Vol) + Ans	-.080	-.142	.129	-.117	-.104	.081	.033	.161	-.229	-.254	-.159	.048	.050	.117	.149	-.244
22. (Product + Choice) To (Vol + Call) + Ans	-.003	-.319	.115	-.096	.393**	-.123	-.060	-.313	-.339**	-.252	-.194	-.050	.075	-.213	.277	-.281
Teacher Feedback																
23. Correct (+) Ans, Affirmed	.000	-.324*	-.070	-.127	.201	-.132	.028	-.096	-.479**	-.366*	-.321	-.122	.123	-.074	.326*	-.241
24. + Ans, No Response	-.065	-.261	.250	-.048	.150	.212	-.180	-.087	-.091	-.218	-.061	.289	-.007	.001	.048	-.346*
25. Failure to Ans +, Terminated	-.008	-.015	.089	.003	-.108	-.023	-.073	.120	.179	.191	.252	.369*	.444**	-.144	-.369*	-.024
26. Failure to Ans +, Sustained	-.262	.027	-.132	-.166	.172	.172	.352*	-.171	-.321	-.442**	-.100	-.241	-.251	-.044	.415**	-.119
27. Student Initiated	.135	-.244	.017	-.021	.384**	-.351*	-.195	-.318	-.073	.036	-.385**	-.279	-.036	.252	.225	-.212
Totals Private and Public																
28. Acad with Praise / Total Work Contacts	.146	.126	.019	.126	-.272	.029	-.154	.234	-.139	-.072	-.249	.188	.326	-.074	-.217	.375*
29. Acad with Criticism / Total Work Contacts	.055	.089	-.150	.362*	-.065	-.227	.016	-.016	.018	.323*	.234	.052	-.003	.158	-.346*	.433**

* .10 > p > .05
** .05 > p > .01
*** p < .01

TABLE 4

TEACHER 2 - CORRELATIONS BETWEEN S AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1. Private Interactions	.197	-.034	-.414*	.112	.058	.125	.312	-.069	.256	-.141	-.321	-.458**	.565***	-.289	.254	.273
2. Teacher Initiated	-.114	.161	-.352	.294	-.271	.102	.398*	.058	.219	.155	.112	-.019	.075	-.162	-.011	.126
3. Work (Brief + Obs)	-.020	.558***	.042	.355	-.361	-.133	.104	-.134	-.248	-.168	.469**	.328	.273	-.162	-.248	.516**
4. Work, Long	-.236	.147	-.216	.287	-.374*	-.029	.264	.168	-.186	.035	.319	.224	-.006	.059	-.203	.043
5. Procedure	.090	-.025	-.540**	-.043	-.262	.165	.502**	.259	.107	-.004	-.218	-.148	.139	-.021	.061	.058
6. Behavior, Warn	.013	-.118	-.069	.030	.088	.189	.109	-.070	.620***	.343	-.169	-.312	-.121	-.217	.267	-.174
7. Work/Total	-.155	.406*	-.131	.262	-.135	-.094	.069	-.118	-.431*	-.155	.368	.344	.110	-.052	-.172	.183
8. Proc/Total	.177	-.303	-.351	-.122	-.255	.154	.104	.394*	.057	.049	-.252	-.085	.159	.104	-.101	.054
9. Beh/Total	.065	-.184	.459**	-.207	.175	.040	-.156	-.064	.393*	.127	-.163	-.243	-.247	-.001	.238	-.309
10. Student Initiated	.296	-.125	-.311	-.030	.211	.097	.165	-.113	.193	-.251	-.444**	-.539**	.636***	-.262	.311	.262
11. Work, Brief	.373	-.091	-.290	-.077	.222	.097	-.043	-.094	.122	-.196	-.429*	-.453**	.672***	-.107	.148	.325
12. Work, Long	.168	-.079	-.384*	-.075	.087	.111	.401*	-.011	.123	-.252	-.463**	-.501**	.540**	-.278*	.422*	.211
13. Work/Total	.008	.030	-.408*	-.094	.122	.348	-.047	-.056	.064	.056	-.468**	-.304	.248	.039	.164	-.278
14. Work, Long/T & S Work	-.391	-.243	-.013	-.126	-.136	-.128	.421*	.348	-.090	.007	.065	.012	-.190	-.309	.327	-.135
15. Work, Brief/T & S Work	.313	.226	.025	.096	.091	.079	-.474**	-.182	.059	-.022	-.081	-.026	.206	.253	-.352	.143
16. Public Interactions	-.115	-.159	-.451**	076	.413*	-.080	.134	-.238	.541**	.401**	-.349	-.478**	.298	-.277	.121	.274
17. Teacher Initiated	-.304	-.120	-.488**	.036	.173	.040	.330	-.045	.173	.302	-.137	-.251	.130	-.333	.156	.205
18. Self Ref Ques	-.080	-.407*	-.500**	-.144	-.018	.342	-.115	.271	-.026	.143	-.380*	.006	.006	-.395*	.365	-.229
19. Process To (Pre + N Vol) + Ans	.136	-.075	-.343	-.022	.010	.119	-.120	.072	-.012	-.093	-.266	-.131	.692***	-.400*	.144	.354
20. Process To (Vol + Call) + Ans	.029	.100	.058	.305	.374*	.022	.220	-.502***	.168	-.054	-.262	-.192	-.080	-.027	.202	-.034
21. (Product + Choice) To (Pre + N Vol) + Ans	-.324	.293	-.178	.101	.125	-.254	.024	-.176	-.177	.120	.394*	.105	.241	0.14	-.379*	.532**
22. (Product + Choice) To (Vol + Call) + Ans	-.393*	-.115	-.085	.146	.364	-.027	.185	-.297	.414*	.389	-.169	-.317	-.017	-.088	.081	-.043
Teacher Feedback																
23. Correct (+) Ans, Affirmed	-.413*	-.107	-.162	.235	.476**	-.031	.087	-.405*	.441**	.448**	-.219	-.246	.011	-.170	.069	.054
24. + Ans, No Response	-.019	.239	-.027	168	-.085	.018	.360	-.119	-.175	-.158	.311	-.152	.247	.083	-.045	.036
25. Failure to Ans +, Terminated	-.136	.108	.005	.266	-.124	-.062	.398	-.060	.026	.066	.356	.031	-.214	-.253	.009	.427*
26. Failure to Ans +, Sustained	-.190	.526**	.170	.379*	-.076	-.388**	.168	-.264	-.241	-.141	.606***	.331	.435**	.002	-.441**	.630***
27. Student Initiated	.015	-.156	-.354	.093	.481**	-.093	.042	-.310	.107	-.004	-.218	-.148	.139	-.021	.061	.098
Totals Private and Public																
28. Acad with Praise/Total Work Contacts	.003	.092	.128	.360	.230	-.131	.028	-.373*	.179	.019	.349	.078	-.129	-.182	.033	.030
29. Acad with Criticism/Total Work Contacts	-.135	-.255	-.069	.302	-.235	-.010	-.003	.192	-.169	-.139	-.055	.318	-.216	-.165	.152	-.180

* .10 > p > .05
** .05 > p > .01
*** p < .01

TABLE 5

TEACHER 3 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

	Process Variables	MAT Total Reading	MAT Total Math	CAI Total Score	SEI Sch-Ach Subscale	Discipline Visits to Office	Absenteeism
1.	Private Interactions	-.024	-.066	-.032	-.396**	.331*	-.131
2.	Teacher Initiated	-.082	-.188	-.095	-.262	.484***	-.298
†3.	Work (Brief + Obs)	-.235	-.305*	-.113	-.264	-.034	-.043
†4.	Work, Long	-.049	-.145	-.096	.048	.278	-.233
5.	Procedure	-.092	.101	-.361**	-.133	.206	-.076
6.	Behavior, Warn	.042	-.122	.162	-.190	.415**	-.283
7.	Work/Total	-.055	-.259	-.050	.103	-.237	.083
8.	Proc/Total	.003	.038	-.263	-.080	-.157	.162
9.	Beh/Total	.032	-.212	.219	-.066	.350*	-.286
10.	Student Initiated	.068	.144	.073	-.315*	-.088	.174
†11.	Work, Brief	.156	.295	.107	-.214	-.104	-.017
12.	Work, Long	-.015	.020	.091	-.241	-.110	.349*
13.	Work/Total	-.038	.029	.257	-.091	-.025	.035
14.	Work Long/T & S Work	.058	-.121	-.075	.063	.248	-.026
15.	Work Brief/T & S Work	.014	-.025	.024	-.100	-.257	-.033
16.	Public Interactions	.209	-.198	.122	.137	.067	-.248
17.	Teacher Initiated	.198	-.310*	.075	.072	.075	-.221
18.	Self Ref Ques	-.233	-.300	.031	-.185	.395**	-.165
19.	Process To (Pre + N Vol) + Ans	.084	-.234	-.028	.127	.126	.515***
20.	Process To (Vol + Call) + Ans	.395**	-.270	.149	.154	-.173	-.184
†21.	(Product + Choice) To (Pre + N Vol) + Ans	.272	-.060	-.201	-.112	-.232	-.150
†22.	(Product + Choice) To (Vol + Call) + Ans	.206	.016	.225	.206	-.175	-.227
	Teacher Feedback						
23.	Correct (+) Ans, Affirmed	.407**	-.145	.184	.226	-.265	-.206
24.	+ Ans, No Response	--	--	--	--	--	--
25.	Failure to Ans +, Terminated	-.070	-.159	-.051	.079	.206	.355**
26.	Failure to Ans +, Sustained	.130	-.164	-.274	-.009	.100	-.151
27.	Student Initiated	.195	.197	.146	.174	.055	-.243
28.	Totals Private and Public	.093	-.173	.042	-.211	.272	-.225
29.	Acad with Praise / Total Work Contacts	-.335*	-.128	-.158	-.333*	-.097	-.016
30.	Acad with Criticism / Total Work Contacts	.018	.069	-.190	.240	-.103	-.147

† Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 6

TEACHER 3 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CARES DATA

	Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
		A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1.	Private Interactions	.075	.365**	-.102	.007	-.052	-.109	-.250	-.057	-.073	.023	.179	-.028	.632***	.190	-.342*	-.065
2.	Teacher Initiated	.030	.472***	-.126	.032	-.148	.030	-.164	-.094	-.117	.075	.329*	.024	.279	.125	-.260	.083
3.	Work (Brief + Chal)	-.216	.248	.012	.486***	-.183	.119	.188	-.361**	.069	-.243	-.072	-.003	-.045	.102	.136	-.081
4.	Work, Long	.022	.359**	-.135	-.209	.031	.066	-.221	-.021	-.130	.199	.294	.083	.276	-.155	-.171	-.088
5.	Procedure	-.015	.165	.110	-.123	-.099	-.165	-.238	.150	-.194	.083	-.044	.210	.107	-.014	-.120	-.196
6.	Behavior, Warn	.175	.220	-.124	-.035	-.056	.010	-.028	-.046	.001	.095	.348*	-.049	.281	.102	-.274	.078
7.	Work/Total	-.135	.119	.137	.248	-.029	.222	.060	-.262	.236	-.118	-.128	.072	-.170	-.149	.210	-.019
8.	Proc/Total	-.015	-.149	.137	-.358	.003	-.207	-.139	.292	-.136	.028	-.235	.187	-.021	.034	-.046	-.166
9.	Beh/Total	.160	-.013	-.338	-.003	.064	-.010	.102	-.050	-.105	.138	.351*	-.218	.155	.070	-.171	.169
10.	Student Initiated	.085	-.016	-.004	-.030	.110	-.208	-.200	.029	.034	-.061	-.137	-.078	.685***	.151	-.027	.101
11.	Work, Brief	-.135	-.092	.005	-.020	.147	-.199	-.228	.066	-.114	-.008	-.211	-.212	.498**	.121	-.014	-.093
12.	Work, Long	.458***	-.047	-.025	-.052	.077	-.235	.075	-.058	.064	-.119	-.037	.225	.350*	.014	-.370	.289
13.	Work/Total	.222	-.050	.102	-.143	.088	-.371**	.228	-.070	-.318*	-.127	-.121	.195	.053	-.086	.094	-.163
14.	Work, Long/T & S Work	-.065	-.085	-.079	-.175	.150	-.038	-.046	.039	.013	.199	.311*	.341*	.140	-.325	-.338*	.175
15.	Work, Brief/T & S Work	-.492***	-.159	.138	.350*	-.145	-026	.082	.004	.066	-.136	-.280	.314*	-.267	.169	.332*	-.124
16.	Public Interactions	.241	.014	-.103	-.255	.102	.050	.038	.028	-.128	.148	.598***	.074	.263	-.191	-.223	.130
17.	Teacher Initiated	.320*	.039	-.073	-.207	.073	-.014	.023	.009	-.183	.154	.530***	.071	.262	-.213	-.241	.259
18.	Self Pat Ques	.027	.334*	.097	.083	-.152	-.029	-.031	-.148	.198	-.017	.181	.327*	.651***	.006	-.389**	-.101
19.	Process To (Pre + N Vol) + Ans	-.065	.047	-.075	-.067	-.017	-.094	-.044	.071	-.087	.338*	.358**	-.044	-.051	-.098	-.221	.169
20.	Process To (Vol + Call) + Ans	.334*	-.334	-.075	-.208	.180	.014	.111	.051	-.041	-.025	.307*	.036	-.134	-.078	-.064	.115
21.	(Product + Choice) To (Pre + N Vol) + Ans	-.146	-.209	-.099	-.025	.110	.195	-.066	.110	-.196	-.019	.015	-.113	-.178	.095	.181	.051
22.	(Product + Choice) To (Vol + Call) + Ans	.150	-.096	-.299	-.333*	.197	.044	.139	.062	-.166	.095	.303*	-.030	.070	-.185	-.023	.131
	Teacher Feedback																
23.	Correct (+) Ans, Affirmed	.239	-.293	-.321	-.350*	.288	.133	.099	.112	-.175	.061	.412**	-.065	-.058	-.169	.032	.117
24.	+ Ans, No Response	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25.	Failure to Ans +, Terminated	.294	.303	.193	-.071	-.100	-.110	-.117	-.008	-.203	.242	.311*	-.150	.070	-.098	-.170	.326*
26.	Failure to Ans +, Sustained	.123	.006	.189	.057	-.153	-.161	-.084	.104	-.149	.145	.169	-.078	-.063	-.134	-.051	.274
27.	Student Initiated	.154	-.008	-.116	-.365	.113	.095	.045	.040	-.071	.129	.587***	.068	.235	-.154	-.185	.015
	Totals Private and Public																
38.	Acad with Praise / Total Work Contacts	-.138	.051	.016	.265	-.155	.369**	.079	-.092	.081	-.288	-.116	.343*	-.089	.240	-.046	-.233
39.	Acad with Criticism / Total Work Contacts	-.065	-.085	-.079	-.175	.150	.413**	-.046	.039	-.087	.153	.418**	.051	.035	-.424	-.138	-.145

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 7

TEACHER 4 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

	Process Variables	MAT Total Reading	MAT Total Math	CAI Total Score	SEI Sch-Ach Subscale	Discipline Visits to Office	Absenteeism
1.	Private Interactions	-.343*	.383**	-.663***	-.530***	.572***	.103
2.	Teacher Initiated	-.251	.363*	-.589***	-.564***	.717***	-.007
3.	Work (Brief + Obs)	-.227	-.110	.179	.197	-.166	.514***
4.	Work, Long	-.066	-.410**	.048	.020	.299	-.166
†5.	Procedure	-.333*	.411**	-.502***	-.422**	.477**	.144
†6.	Behavior, Warn	-.149	.267	-.595***	-.597***	.697***	-.172
7.	Work/Total	.144	-.430**	.464**	.393**	-.140	-.036
8.	Proc/Total	.032	.192	.157	.332*	-.209	.089
9.	Beh/Total	.132	-.177	-.104	-.034	.167	-.225
10.	Student Initiated	-.290	.240	-.353*	.094	-.118	.254
†11.	Work, Brief	-.277	.291	-.118	.245	-.289	.401**
†12.	Work, Long	-.110	.349*	-.455**	.170	.088	-.043
13.	Work/Total	-.118	.167	.068	.038	.035	.168
14.	Work Long/T & S Work	.011	.208	-.199	-.172	.365*	-.384**
15.	Work Brief/T & S Work	.125	.275	.288	.190	-.449**	.259
16.	Public Interactions	.049	.646***	.056	-.106	-.189	-.338*
17.	Teacher Initiated	.030	.665***	.030	.003	-.258	-.310
18.	Self Ref Ques	.362*	--	.247	.261	-.082	-.164
19.	Process To (Pre + N Vol) + Ans	.042	--	-.259	-.202	-.100	-.122
†20.	Process To (Vol + Call) + Ans	.367*	.456**	.117	.151	.052	-.490***
21.	(Product + Choice) To (Pre + N Vol) + Ans	-.044	.438**	-.197	.083	.085	-.094
†22.	(Product + Choice) To (Vol + Call) + Ans	.008	.557***	.125	.052	-.332*	-.251
	Teacher Feedback						
†23.	Correct (+) Ans, Affirmed	.086	.551***	.139	.095	-.281	-.348*
24.	+ Ans, No Response	.224	.241	-.165	-.140	.098	-.153
25.	Failure to Ans +, Terminated	-.097	.449***	-.064	-.091	-.242	-.080
26.	Failure to Ans +, Sustained	.073	.325*	.127	.262	-.132	-.230
27.	Student Initiated	.102	-.042	-.393**	-.511***	.224	-.245
28.	Totals Private and Public	-.119	.566***	-.358*	-.338*	.109	-.236
29.	Acad with Praise /Total Work Contacts	.085	.094	-.081	.010	.109	-.065
30.	Acad with Criticism /Total Work Contacts	-.351*	--	-.330*	-.035	.032	.316

† Indicates main interaction sequences.

* .10 ⩾ p > .05
** .05 ⩾ p > .01
*** p ⩽ .01

TABLE 8

TEACHER 4 - CORRELATIONS BETWEEN S AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1. Private Interactions	.180	.607***	.473**	.226	-.079	.151	-.451**	-.508***	.227	.243	.184	.004	.431**	-.315	-.285	.356*
2. Teacher Initiated	.130	.724***	.497***	.273	-.295	.173	-.304	-.408**	.225	.289	.170	-.030	.254	-.273	-.176	.186
3. Work (Brief + Obs)	.349*	-.079	.364	.432	-.240	.009	-.120	-.117	-.189	.019	-.208	-.018	.100	-.174	.049	.046
4. Work, Long	-.256	.305	-.167	-.278	.120	-.134	-.153	.078	.075	-.146	-.013	-.127	.189	-.063	.079	-.036
5. Procedure	.050	.483***	.498***	.378**	-.408**	.275	-.218	-.226	.208	.394**	.147	.045	.053	-.243	-.085	-.052
6. Behavior, Warn	.147	.721***	.429**	.183	-.168	.109	-.260	-.477***	.226	.178	.169	-.065	.328*	-.185	-.231	.344*
7. Work/Total	-.151	-.280	-.176	-.164	.207	-.190	-.007	.138	-.153	-.031	-.235	-.153	-.083	.431**	-.013	.190
8. Proc/Total	-.167	-.274	-.065	.152	-.037	.144	.174	.079	-.075	.201	-.189	-.223	-.092	.264	.132	-.136
9. Beh/Total	.113	.130	-.030	-.079	.251	-.147	-.411**	-.185	.112	.023	.318	.116	.128	-.079	-.260	.329*
10. Student Initiated	.158	-.051	.098	-.026	.412**	.001	-.434**	-.358*	.074	-.016	.084	.049	.490***	-.183	-.307	.453**
11. Work, Brief	.284	-.202	-.022	-.044	.237	.117	-.322*	-.051	-.112	.009	-.089	.013	.353*	-.218	-.086	.149
12. Work, Long	.098	.119	.000	-.071	.369*	-.254	-.176	-.405**	.174	-.100	.123	-.032	.343*	-.077	-.187	.209
13. Work/Total	-.179	-.150	-.101	-.063	-.204	.051	.250	.357*	.011	.227	-.069	.025	.030	.055	.021	-.207
14. Work, Long/T & S Work	-.196	.254	-.063	-.255	.212	-.279	.003	-.167	.210	-.143	.199	.014	.148	.385	-.197	.186
15. Work, Brief/T & S Work	.221	-.342*	.055	.228	-.179	.147	.160	.158	-.300	-.045	-.248	-.074	-.178	-.212	.313	-.283
16. Public Interactions	.116	-.162	-.070	-.028	.269	.031	-.380**	-.068	.034	-.215	.188	.089	.195	-.341*	-.075	.145
17. Teacher Initiated	.114	-.221	-.112	-.030	.223	-.036	-.340*	.025	.014	-.244	.133	.080	.160	-.364*	-.025	.114
18. Self Ref Comm	-.094	-.194	.006	-.201	.148	-.085	.018	.094	-.053	-.069	-.094	-.154	-.091	.303	.156	-.154
19. Process To (Pre + H Vol) + Ans	-.045	-.048	.115	.254	.072	-.077	-.023	-.273	.161	-.017	.247	.104	.259	-.029	-.172	.025
20. Process To (Vol + Call) + Ans	-.129	-.166	-.151	-.153	.211	-.419**	-.062	.072	-.048	-.242	.165	.154	-.046	-.263	.045	-.138
21. (Product + Choice) To (Pre + H Vol) + Ans	.016	.178	.065	.224	-.121	-.027	.048	-.169	.245	.406**	.189	.085	.181	-.046	-.246	.084
22. (Product + Choice) To (Vol + Call) + Ans	.219	-.291	-.141	-.032	.203	.002	-.304	.088	-.096	-.299	.017	.019	.100	-.321*	.052	.111
Teacher Feedback																
23. Correct (+) Ans, Affirmed	.146	-.303	-.121	-.025	.214	-.101	-.287	.075	-.081	-.325*	.064	.060	.094	-.324*	.047	.065
24. + Ans, No Response	.181	.016	-.385**	-.216	.353*	-.141	-.034	-.053	-.035	-.064	.223	.138	-.150	-.320*	.029	-.052
25. Failure to Ans +, Terminated	.176	-.091	-.134	.007	.213	.083	-.392**	-.054	.097	-.066	.161	.107	.172	-.417**	-.130	.243
26. Failure to Ans +, Sustained	-.162	-.075	-.046	.021	.047	-.036	-.142	.054	.161	-.134	.143	.035	.197	-.190	.011	-.097
27. Student Initiated	.052	.194	.156	-.042	.299	.296	-.314	-.425**	.094	.044	.306	.072	.225	-.032	-.242	.188
Totals Private and Public																
28. Acad with Praise / Total Work Contacts	-.100	-.057	.103	.188	-.078	.007	.306	-.105	.107	.357*	.117	.161	-.192	-.145	.022	-.313
29. Acad with Criticism / Total Work Contacts	-.029	.170	.504***	.341*	-.333*	.480***	-.120	-.141	.020	-.014	-.070	-.085	.204	.115	-.140	.355*

* .10 > p > .05
** .05 > p > .01
*** p < .01

TABLE 9

TEACHER 5 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

	Process Variables	MAT Total Reading	CAI Total Score	SEI Sch-Ach Subscale	Discipline Visits to Office	Absenteeism
1.	Private Interactions	.410**	.006	-.111	.030	.017
2.	Teacher Initiated	.252	-.064	-.055	.083	-.137
†3.	Work (Brief + Obs)	-.170	-.320	-.006	.185	.008
†4.	Work, Long	.101	-.005	.196	.085	.268
†5.	Procedure	.318	.035	-.109	.023	-.310
6.	Behavior, Warn	.359*	.072	-.098	-.013	-.115
7.	Work/Total	-.353*	-.233	.168	.140	.527***
8.	Proc/Total	.135	.091	.031	-.027	-.622***
9.	Beh/Total	.280	.135	-.158	-.076	.002
10.	Student Initiated	.404**	.071	-.122	-.032	.159
†11.	Work, Brief	.447**	.093	.016	.128	.084
†12.	Work, Long	.178	-.040	-.251	-.096	.058
13.	Work/Total	.217	.265	-.063	-.008	-.319
14.	Work Long/T & S Work	.064	.018	-.026	-.166	.011
15.	Work Brief/T & S Work	-.100	-.019	.063	.193	-.049
16.	Public Interactions	.469**	.165	-.027	-.193	-.209
17.	Teacher Initiated	.446**	.277	.176	-.166	-.139
18.	Self Ref Ques	.351*	.161	.210	-.004	-.247
19.	Process To (Pre + N Vol) + Ans	.228	.162	.352*	-.124	.068
†20.	Process To (Vol + Call) + Ans	.215	-.137	-.435**	.089	-.093
21.	(Product + Choice) To (Pre + N Vol) + Ans	.309	.023	-.147	-.250	-.046
†22.	(Product + Choice) To (Vol + Call) + Ans	.336	.427**	.513***	-.238	-.100
	Teacher Feedback					
†23.	Correct (+) Ans, Affirmed	.433**	.165	.124	-.031	-.142
†24.	+ Ans, No Response	.234	.286	.214	-.279	.010
25.	Failure to Ans +, Terminated	.204	.294	.163	-.014	-.154
26.	Failure to Ans +, Sustained	.184	.085	.083	-.165	-.049
†27.	Student Initiated	.357*	.003	-.227	-.164	-.219
28.	Totals Private and Public	.483**	.094	-.076	-.089	-.105
29.	Acad with Praise / Total Work Contacts	.288	.189	.217	.008	.146
30.	Acad with Criticism / Total Work Contacts	.058	-.151	-.208	.266	.040

†Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 10

TEACHER 5 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1. Private Interactions	.497**	.405**	.118	-.241	-.204	.008	.093	-.068	.396**	.244	.087	-.300	.370*	.101	-.099	-.402**
2. Teacher Initiated	.097	.423**	-.089	-.182	-.198	.054	.232	-.108	.359	.146	.206	-.223	.305	.050	-.002	-.406**
3. Work (Brief + Obs)	-.121	-.002	-.008	-.187	-.147	-.105	.139	.174	-.136	.016	.306	-.032	.306	.065	-.139	-.117
4. Work, Long	.006	.200	-.349	-.421**	-.105	-.048	.491**	-.073	-.236	-.336*	.009	-.106	-.142	.023	.320	-.181
5. Procedure	.110	.418**	-.044	-.023	-.145	.196	-.006	-.128	.285	.166	.039	-.181	.308	-.123	.140	-.335
6. Behavior, Warn	.022	.435**	-.037	.009	-.187	.058	.248	-.180	.519***	.181	.016	-.332	.193	.257	-.157	-.379*
7. Work/Total	-.247	-.449**	.130	-.188	.056	-.232	.061	.216	-.449**	-.312	.135	.200	-.187	.001	-.028	.337*
8. Proc/Total	.090	.327	-.135	.226	-.145	.327	-.221	-.021	.130	.112	-.147	-.017	.089	-.203	.228	-.149
9. Beh/Total	.365*	.284	-.165	-.025	-.106	.142	.093	-.096	.572***	.187	-.088	-.349*	.331	.381*	-.331	-.317
10. Student Initiated	.690**	.231	.271	-.205	-.131	-.040	-.078	-.003	.374*	.243	-.063	-.258	.289	.111	-.156	-.243
11. Work, Brief	.403**	.298	.360*	-.191	-.342*	-.103	.099	.133	.473**	.098	-.052	-.392*	.354	.219	-.102	-.347*
12. Work, Long	.740***	.136	-.068	-.150	.066	.084	-.165	-.099	.019	.246	-.047	.034	.255	-.146	-.054	-.051
13. Work/Total	-.076	.019	-.200	-.063	.122	-.172	.131	.148	-.118	-.138	.087	.579***	.000	-.145	.038	-.014
14. Work, Long/T & S Work	.324	.240	-.339*	.119	.048	.154	.008	-.168	-.302	-.111	-.138	.148	-.131	-.230	.317	.039
15. Work, Brief/T & S Work	-.268	-.173	.298	.143	-.092	-.106	-.103	.207	.333	.214	.082	-.170	.075	.348	-.327	-.043
16. Public Interactions	.312	.442**	.202	-.066	-.026	-.056	.093	-.350*	.193	.121	-.023	-.261	.324	-.166	.202	-.262
17. Teacher Initiated	.048	.327	.211	-.135	-.037	-.120	.232	-.283	-.064	-.040	-.078	-.202	.083	-.241	.435**	-.230
18. Self Ref Ques	.144	.383*	.311	.069	-.329	.010	.105	.008	.581***	.223	-.075	-.304	.106	.003	.151	-.398*
19. Process To (Pre + N Vol) + Ans	-.124	.183	-.165	-.114	-.022	-.191	.634***	-.275	-.107	-.167	-.098	-.285	-.161	-.011	.409**	-.273
20. Process To (Vol + Call) + Ans	.252	.413**	-.041	-.155	.075	.228	-.198	-.299	-.005	.040	.095	.135	.231	-.239	-.042	.217
21. (Product + Choice) To (Pre + N Vol) + Ans	.510***	.304	-.180	.120	.079	-.275	.047	-.315	-.153	.048	-.142	-.379*	.312	-.015	.012	-.050
22. (Product + Choice) To (Vol + Call) + Ans	-.353	.057	.425**	-.097	-.133	-.290	.248	-.005	-.178	-.109	-.193	-.223	-.184	-.131	.555***	-.333
Teacher Feedback																
23. Chris + (+) Ans, Affirmed	.087	.478**	.198	-.186	-.199	-.112	.082	-.129	-.055	.039	.031	-.177	.209	-.238	.329	-.268
24. + Ans, No Response	-.044	.053	-.006	.123	.143	-.278	.347*	-.343*	-.220	-.138	-.272	-.242	-.262	-.048	.395*	-.085
25. Failure to Ans +, Terminated	-.159	.198	.333	.100	-.111	.033	.058	-.107	.239	.418**	.066	-.123	-.153	-.208	.249	-.182
26. Failure to Ans +, Sustained	.467**	.193	-.313	.045	.123	-.164	.334	-.341*	-.091	-.039	-.140	-.213	.288	-.174	.179	-.031
27. Student Initiated	.490**	.432**	.134	.023	-.006	.035	-.076	-.317	.399**	.250	.040	-.245	.477**	-.041	-.095	-.252
Totals Private and Public																
28. Acad with Praise / Total Work Contacts	-.009	-.039	-.036	-.418**	.270	-.031	.111	-.258	-.196	-.034	-.181	-.046	.130	-.049	.011	.065
29. Acad with Criticism / Total Work Contacts	-.074	.110	.395*	-.073	-.288	-.113	.268	.120	-.063	-.138	.769***	.165	.290	-.111	-.055	-.079

* .10 > p > .05
** .05 > p > .01
*** p < .01

TABLE 11

TEACHER 6 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

Process Variables	MAT Total Reading	CAI Total Score	SEI Sch-Ach Subscale	Discipline Visits to Office	Absenteeism
1. Private Interactions	-.274	-.212	-.102	.139	.199
2. Teacher Initiated	-.134	-.125	.020	-.004	.281
†3. Work (Brief + Obs)	.015	-.374*	.102	.089	.217
†4. Work, Long	-.078	-.148	.128	.115	.019
†5. Procedure	-.145	-.124	-.135	-.279	-.124
†6. Behavior, Warn	-.118	.223	-.006	.362*	.521***
7. Work/Total	-.113	-.415**	-.042	.172	.044
8. Proc/Total	.089	.104	-.135	-.332	-.347*
9. Beh/Total	-.058	.189	.284	.471**	.509***
10. Student Initiated	-.342*	-.211	-.308	.362*	-.232
11. Work, Brief	-.016	.048	.102	-.052	-.317
12. Work, Long	.092	-.195	.042	.054	-.236
13. Work/Total	.349*	.181	.223	-.286	.151
14. Work Long/T & S Work	.223	.111	.053	-.048	-.104
15. Work Brief/T & S Work	.225	.194	-.080	-.079	-.081
16. Public Interactions	.126	.180	.151	-.096	-.062
17. Teacher Initiated	-.004	.082	.032	-.033	-.122
18. Self Ref Ques	.310	.358	.194	-.327	-.242
†19. Process To (Pre + N Vol) + Ans	.164	-.230	-.048	.094	-.091
†20. Process To (Vol + Call) + Ans	.021	.241	.131	-.088	.043
†21. (Product + Choice) To (Pre + N Vol) + Ans	-.114	-.038	-.082	-.231	-.060
22. (Product + Choice) To (Vol + Call) + Ans	.199	.103	-.036	-.236	-.275
Teacher Feedback					
†23. Correct (+) Ans, Affirmed	.048	.015	-.001	-.139	-.221
†24. + Ans, No Response	.105	.125	.013	-.200	.083
25. Failure to Ans +, Terminated	.005	.168	-.118	.197	.138
†26. Failure to Ans +, Sustained	-.189	-.188	.002	.105	-.026
†27. Student Initiated	.352*	.315	.341*	-.191	.095
28. Totals Private and Public	.041	.108	.111	-.050	-.002
29. Acad with Praise /Total Work Contacts	-.095	-.248	.054	.098	-.013
30. Acad with Criticism /Total Work Contacts	--	--	--	--	--

† Indicates main interaction sequences.

* .10 ⩾ p > .05
** .05 ⩾ p > .01
*** p ⩽ .01

TABLE 12

TEACHER 6 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

Process Variables	Teacher Directed Settings								Non Teacher Directed Settings							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
1. Private Interactions	.232	.157	.151	-.183	.184	.190	-.030	-.284	.090	-.100	.247	.251	-.045	-.012	.134	.095
2. Teacher Initiated	.302	.016	.119	-.210	.221	.231	-.044	-.187	.061	-.194	.238	.366°	-.024	-.145	.162	-.029
3. Work (Brief + Obs)	.050	-.269°	-.209	-.049	.155	-.356°	.037	.242	-.188	-.113	.312	.421°°	.094	-.075	.059	-.001
4. Work, Long	.188	-.112	-.078	-.209	.025	.242	-.323	.178	.093	-.020	.325	-.050	.031	-.218	.194	-.265
5. Procedure	.160	-.070	.053	-.314	.352°	.382°	.006	-.185	.151	-.291	-.103	-.126	.153	.002	.249	-.050
6. Behavior, Warn	.238	.442°°	.235	.053	-.122	-.074	.001	-.344°	-.153	.071	.318	.577°°°	-.151	-.190	-.114	.210
7. Work/Total	-.012	-.303	-.329	-.126	.201	-.307	-.062	.217	-.114	.231	.208	-.022	.197	-.077	-.096	-.044
8. Proc/Total	-.057	-.110	.054	-.085	-.059	.149	-.038	.153	.077	-.265	-.228	-.180	-.001	.088	.159	-.030
9. Beh/Total	.090	.465°°	.088	.026	-.009	-.083	.059	-.412°°	-.212	.060	.156	.203	-.063	-.116	-.112	.186
10. Student Initiated	-.205	.354°	.069	.088	-.114	-.126	.038	-.228	.067	.257	.001	-.325	-.051	.350°	-.338°	.315
11. Work, Brief	-.147	-.176	.057	.057	-.101	.050	.085	.192	.229	.062	-.189	-.167	-.191	.217	-.029	.200
12. Work, Long	-.173	-.070	-.129	-.126	.001	.031	.006	.132	-.104	.201	-.193	-.287	.118	.076	.008	.062
13. Work/Total	.098	-.486°°	-.283	-.101	.219	.149	.066	.322	-.133	-.313	-.010	.301	.080	-.154	.488°°	-.178
14. Work, Long/T & S Work	-.100	.159	-.107	-.160	-.159	.197	-.189	.103	-.010	-.010	-.066	-.304	-.070	.018	.103	-.227
15. Work, Brief/T & S Work	-.120	-.137	-.165	-.042	.072	-.015	.177	.089	-.072	-.247	.026	.118	-.111	.228	.180	.022
16. Public Interactions	-.014	-.131	-.053	-.123	.347°	.365°	.326	-.192	.194	.458°°	-.038	-.169	.303	-.189	-.170	.007
17. Teacher Initiated	-.048	-.170	-.130	-.092	.337°	.132	.325	-.133	.084	.402°°	.025	-.153	.411°°	-.147	-.261	.109
18. Self Ref Ques	.084	-.059	.010	.029	.041	.208	.107	-.022	-.021	-.009	-.370°	-.143	.445°°	-.306	-.093	-.098
19. Process To (Pre + M Vol) + Ans	-.209	-.367°	-.457°°	-.114	.335	.084	.146	.156	-.164	.355°	-.073	-.240	.191	-.047	.088	-.071
20. Process To (Vol + Call) + Ans	.043	-.086	-.031	-.050	.344	.349°	.256	-.160	.151	.563°°°	-.183	-.257	.188	-.002	-.282	.074
21. (Product + Choice) To (Pre + ¾ Vol) + Ans	.005	-.124	-.039	-.133	.484°°	.148	.447°°	-.326	.120	.294	.070	-.042	.186	.038	-.119	.105
22. (Product + Choice) To (Vol + Call) + Ans	-.104	-.128	-.340	-.243	.533°°°	.166	.547°°°	-.263	-.171	.104	-.229	-.068	.211	-.201	.044	.133
Teacher Feedback	.020	-.202	-.347°	-.272	.492°°	.256	.308	-.134	-.049	.316	-.225	-.238	.369°	-.086	-.069	.054
23. Correct (+) Ans, Affirmed	-.140	-.063	-.040	.015	.408°°	.062	.568°°°	-.361	-.020	.249	.006	-.040	.100	-.024	-.057	.101
24. + Ans, No Response	-.189	.187	.186	.050	-.015	.101	.271	-.235	.160	.601°°°	.162	-.050	-.008	-.126	-.477°°	.313
25. Failure to Ans +, Terminated	-.039	-.209	-.159	-.126	.264	-.047	.073	.018	.140	.172	.247	-.105	.359°	-.038	-.286	.012
26. Failure to Ans +, Sustained	.064	.009	.135	-.137	.219	.711°°°	.186	-.238	.346°	.383°	-.157	-.133	-.059	-.198	.098	-.216
27. Student Initiated	-.146	-.417°°	-.086	.071	.170	.124	.039	.196	.424°°	.428°°	.320	.009	-.079	-.136	.079	-.233
Totals Private and Public	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28. Acad with Praise / Total Work Contacts																
29. Acad with Criticism / Total Work Contacts																

° .10 ≥ p > .05
°° .05 ≥ p > .01
°°° p ≤ .01

TABLE 13

SPEARMAN RANK CORRELATION COEFFICIENTS BETWEEN HIGH INFERENCE RATINGS ON TEACHER PROCESS VARIABLES AND PUPIL ACHIEVEMENT, ATTITUDE AND BEHAVIORS

N=6 Product Measures	1 Withitness	2 Overlappingness	3 Smoothness	4 Momentum	5 Clarity	6 Persuasiveness	7 Warmth	8 Empathy
Achievement								
CAT Reading Percentile	.464	.085	.600	.580	.771	.441	-.026	-.486
Attitudes (My Class Inventory)								
Satisfaction	.260	.371	.314	.406	.543	.088	.200	.600
Friction	-.116	-.371	-.086	--	-.143	.088	-.314	-.714
Competitiveness	-.899*	-1.000**	-.829*	-.754	-.600	-.794	-.943**	-.543
Difficulty	.231	-.085	.257	.029	.257	.177	.086	-.543
Cohesiveness	.232	.029	.314	.174	.429	.147	-.086	-.257
Self-concept	.405	.257	.429	.115	.600	.088	.429	.143
Behaviors								
Disc. visits to office	-.029	.200	-.143	.029	-.543	.235	.143	.086
Absenteeism	-.522	-.200	-.657	-.667	-.886*	-.441	-.029	.257
Behavior Styles (CASES Observational Data)								
Teacher Directed Settings								
A	-.319	.600	-.200	-.348	.143	-.441	-.543	-.486
B	.261	.543	.143	.058	.029	.088	.714	.771
C	.058	.314	-.086	-.348	-.314	-.088	.571	.486
D	-.290	-.029	-.314	-.464	-.086	-.588	.086	.714
E	.725	.429	.771	.841*	.600	.883*	.257	-.486
F	.667	.429	.771	.725	.943**	.530	.257	-.029
G	-.058	.200	-.086	.174	-.200	.089	-.029	.371
H	-.754	-.771	-.657	-.493	-.371	-.677	-.886*	-.257
Non-Teacher Directed Settings								
A	.638	.486	.714	.609	.943**	.383	.429	.257
B	-.464	-.143	-.543	-.348	-.600	-.383	-.086	.429
C	-.870*	-.771	-.829*	-.812	-.486	-.971**	-.771	.086
D	-.725	-.714	-.657	-.638	-.257	-.853*	-.600	.029
E	.725	.486	.771	.812	.600	.853*	.258	-.371
F	.638	.829*	.543	.348	.429	.383	.943**	.771
G	-.174	-.371	-.086	.058	-.086	.059	-.600	-.657
H	-.232	-.371	-.200	.058	-.371	.147	-.543	-.714

* $p \leq .05$
** $p \leq .01$

TABLE 14

SUMMARY OF RESULTS OF CORRELATIONS BETWEEN TEACHER BEHAVIORS AND PUPIL ACHIEVEMENT, ATTITUDES, SELF CONCEPT AND BEHAVIORS

B & E Process Variables (Teachers)	Reading Achievement 1 2 3 4 5 6	Attitudes 1 2 3 4 5 6	Self-concept 1 2 3 4 5 6	Productive Behaviors* T.D. Setting 1 2 3 4 5 6	N-T.D. Setting 1 2 3 4 5 6
1. Private Interactions	- +	- -	+ - -	-	-
2. Teacher Initiated		- -	-	+	
3. Work (Brief + Chs)			+		
4. Work, Long				- - +	
5. Procedure	-	-	-	+ - +	
6. Behavior Warn	+	- - -	-		
7. Work/Total	-	+ -	+		
8. Proc/Total			+		
9. Beh/Total		-		-	
10. Student Initiated	+	-	+	+	-
11. Work, Brief	+	+	+ +	- -	
12. Work, Long		-		+ + +	+
13. Work/Total			+		-
14. Work, Long/T & S Work	+		-	+	-
15. Work, Brief/T & S Work	-		+	-	+
16. Public Interactions	+ +	- -	+	+ + - +	
17. Teacher Initiated	+ + +	-	+ -	- +	+
18. Self Ref Ques	+ + +				-
19. Process To (Pre + N Vol) + Ans			+	+	- +
20. Process To (Vol + Call) + Ans	+ + +		-	+	
21. (Product + Choice) To (Pre + N Vol) + Ans	+	-		+	
22. (Product + Choice) To (Vol + Call) + Ans	+	- +	- +	+ +	+
Teacher Feedback					
23. Correct (+) Ans, Affirmed	+ + + +	-		+ +	+
24. + Ans, No Response				+ + +	+
25. Failure to Ans +, Terminated			-	-	- -
26. Failure to Ans +, Sustained				+	+ -
27. Student Initiated	+ +	- -	+ -	+ +	
28. Total Private and Public	+	-	-		
29. Acad with Praise/Total Work Contacts	-				
30. Acad with Criticism/Total Work Contacts	-	-		-	-
High Inference Variables	N=6	N=6	N=6	N=6	N=6
1. Withitness		+			
2. Overlappingness		+			
3. Smoothness		+			
4. Momentum				+	
5. Clarity					
6. Persuasiveness				+	
7. Warmth		+			
8. Empathy					

*Productive Behaviors - It was determined that styles E and G in T.D. settings and styles G in N-T.D. settings were productive in terms of Reading Achievement.

+ = positive and significant correlations.
- = negative and significant correlations.